

IEEE Northern Australia 2022 Section Report

PART A - SECTION SUMMARY

A.1 Executive Summary – (Please follow the format given below)

- Section Executive Committee Member List

Position	Exec Committee Member
NA Section Chair	Mostafa Rahimi Azghadi
NA Section Vice Chair	Bronson Philippa
Treasurer	Maryam Ebrahimpour
Secretary	Kenny Leong
Web Master	Melanie Olsen
Professional Activities Coordinator	Shou-Han Zhou
Membership Dev Officer	Ron Goodwin
Technical Activities Coordinator	Mohan Jacob
Educational Activities Coordinator	Mohan Jacob
Industry Relations Coordinator	Joel Cox
Student Activities	Mohan Jacob
Student Branch Mentor	Shou-Han Zhou
Student Representative	Ethan Waters
Power & Energy Society Chapter	
PES Chair	Kianoush Emami
PES Vice Chair	Graham Woods
Communication Society Chapter	
MTT-S/Com Sec Chair	Mohan Jacob
MTT-S/Com Sec Vice Chair	Tao Huang
Oceanic Engineering Society Australia Chapter	
OES Rep	Ron Goodwin
Women in Engineering Affinity Group	
WIE Chair	Maryam Ebrahimpour
Young Professional Affinity Group	
YP Chair	Tao Huang

- Section Highlights
 - 26 events** were held by the Section and its 2 chapters, 2 affinity groups, and 1 student branch including 7 in-person Exec Meetings, and 7 in-person technical and social events.
 - Member growth of >10%** at the beginning of 2023, compared to the beginning of 2022 year.
 - Success of The Student Branch** based at James Cook University (JCU) Townsville, Robot-X Global Competition.
 - This is a biannual international autonomous maritime system event which incorporates a surface vehicle and drone to autonomously work in tandem to complete a set of tasks. Just over \$20,000 worth of sponsorship was attracted by the student branch and was utilised to attend and participate in this competition with nine core team members and a further five contributing to a smaller extent. This event was held between 11/11/2022

to 18/11/2022 with over 20 international teams attending with hundreds of students attending ranging from undergraduates to PHD candidates.

- The student branch was very grateful to be recognised for their effective low-cost design, being **awarded \$1000 USD** from RoboNation and four T500 motors from Blue Robotics.



The IEEE Student Branch (JCU Robotics Club), led by Ethan Waters, the IEEE student branch chair, at the event in Sydney.

- The Flagship annual event of the IEEE Northern Australia Section, i.e. the Peter Arlette Lecture, was held in conjunction with the PES Chapter.
 - The Peter Arlett lecture is IEEE North Australia section and PES chapter's most prestigious event each year in Townsville where the chapter reaches out to the local Power Engineering community with a technical presentation of interest to the sections' members. In 2022, the lecture was preceded by a social networking event with finger food and drinks.
 - The 2022 PA Lecture was delivered by two internationally recognised leaders in the field of Net Zero and its future. The two speakers and their talk titles were as follows:
 - Prof. Syed Islam of Federation University
Topic: Australian Net Zero Target in 2050: Challenges and Opportunities
 - Dr Daniel Eghbal of Energy Queensland
Topic: A smarter grid driven by net zero emission targets

The event was attended by ~40 IEEE and non-IEEE members from across the Townsville region, representing the local industry, university researchers, and postgraduate and undergraduate students, as well as the Arlett's family.



Prof Syed Islam, IEEE Fellow



Dr Daniel Eghbal, Energy Queensland, IEEE Australia Council Chair

- Major Chapter Activities
 - MTT-S/Com Society Chapter:
 - Organized a face-to-face distinguished lecturer seminar at Cairns and hosted Professor Levent Sevgi.
 - The students very much liked the opportunity to have face-to-face communication with world-leading researchers.
 - Attended the IEEE Globe Chapter Community Congress 4-5 December, Brazil.
 - Power and Energy Society Chapter
 - The main and most recognized Section event, i.e. the PA lecture, was organized and planned by the PES chapter, in collaboration with the Section chair, on Thursday 13th October 2022.
- Major Student and Affinity Group Activities
 - Student Branch:
 - Robo-X robotic development and competition, as described further below and above.
 - Organising several event included a robotic competition at James Cook University, and an Arduino Workshop at a local primary school. See below for more details.
 - The student branch Vice Chair, Connor Keir, attended the IEEE ANZCON Meeting, Adelaide University, in October 2022. The travel was supported by the local NA Section.
 - Women in Engineering:
 - Held more than 10 joint events in 2023. For details see below Sections.
 - The affinity group Chair, Maryam Ebrahimpour, attended the IEEE WIE International Leadership Summit, 4th and 5th August 2022, Monash University, Melbourne. The travel was supported by the local NA Section.
 - Young Professionals:
 - Held more than 10 joint events in 2023. For details see below Sections.
 - The affinity group Chair, Tao Huang, attended the IEEE 2022 Region 10 Students, Young Professionals, Women in Engineering, Life Members Congress at Jeju Island, Korea. The travel was supported by the local NA Section and the registration cost covered by R10.
- Awards
 - The section received **certificate of recognition** from the IEEE Member Recruitment and Recovery Committee for outstanding achievement in member retention in 2022.
 - PES chapter received a 2021-2022 **IEEE PES High Performing Chapter** Program award and prize

- Received an **honorary mention** in the 2022 ComSoc Student Competition "Communications Technology Changing the World." A project proposal with the title "IoT-Enabled Smart Farming in Queensland" received an Honorary Mention. It was ranked among the best 14 projects among the 67 submitted (20%).

A.2 Financial Report – (Please follow the format given below)

- Summary (as per submitted on NetSuite)
 - Over the reporting period, payments were made to support awards, committee member attendance at IEEE events for professional development, and meeting catering. These were paid from our local bank account, as well as from our IEEE concentration banking account.
 - Local Bank Account Expenses are as follows

Effective Date	Entered Date	Transaction Description	Amount	Balance
	31/12/2022	Interest Credit	\$1.00	\$7,379.97
	31/12/2022	Monthly Account Fee	-\$5.00	\$7,378.97
	30/11/2022	Monthly Account Fee	-\$5.00	\$7,383.97
31/10/2022	1/11/2022	Monthly Account Fee	-\$5.00	\$7,388.97
	19/10/2022	Ext TFR - NET# 1639293554 to 10369715 Graham Woods CBA – Aitkenvale – PA Lecture Accommodation	-\$304.20	\$7,393.97
	19/10/2022	Ext TFR - NET# 1639293539 to 14121879 Kianoush Emami CBA – Cairns - PA Lecture Speaker Airfare	-\$998.63	\$7,698.17
	19/10/2022	Ext TFR - NET# 1639293504 to 12276169 Daniel Eghbal BAU - Bank Australia - PA Lecture Speaker Airfare	-\$672.41	\$8,696.80
	10/10/2022	Ext TFR - NET# 1633476223 to 695512 Connor Keir WBC – Castletown – Student Branch attendance at ANZCON 2022	- \$1,254.24	\$9,369.21
	10/10/2022	Ext TFR - NET# 1633473326 to 11006484 Tao Huang CBA - 96 King William Street Adelaide – Distinguished Lecture Catering	-\$180.31	\$10,623.45
30/09/2022	1/10/2022	Interest Credit	\$0.44	\$10,803.76
30/09/2022	1/10/2022	Monthly Account Fee	-\$5.00	\$10,803.32
31/08/2022	1/09/2022	Monthly Account Fee	-\$5.00	\$10,808.32
	24/08/2022	Ext TFR - NET# 1604244766 to 10619392 Maryam Ebrahimpour CBA - University of Sydney - The IEEE WIE International Leadership Summit attendance	- \$1,200.28	\$10,813.32
31/07/2022	1/08/2022	Monthly Account Fee	-\$5.00	\$12,013.60

	21/07/2022	Ext TFR - NET# 1583567295 to 00050019 James Cook University CBA – Townsville – Student Award Sponsorship	-\$500.00	\$12,018.60
30/06/2022	1/07/2022	Monthly Account Fee	-\$5.00	\$12,518.60
31/05/2022	1/06/2022	Monthly Account Fee	-\$5.00	\$12,523.60
	24/05/2022	Ext TFR - NET# 1548092779 to 700395 Charles Darwin University WBC – Darwin - Student Award Sponsorship	-\$300.00	\$12,528.60
	19/05/2022	Ext TFR - NET# 1545239992 to 00906547 IEEE ACT Section CBA – Belconnen – Tree Plantation Support to IEEE ACT Section during R10 Visit to Australia	-\$150.00	\$12,828.60
30/04/2022	1/05/2022	Monthly Account Fee	-\$5.00	\$12,978.60
	12/04/2022	Ext TFR - NET# 1522918383 to 10619392 Seyedmostafa Rahimiazghadi CBA - University of Sydney – Section chair attendance at the IEE Australia Council face-to-face Meeting	- \$1,420.13	\$12,983.60
31/03/2022	1/04/2022	Monthly Account Fee	-\$5.00	\$14,403.73
	22/03/2022	Ext TFR - NET# 1510010310 to 00050019 James Cook University CBA – Townsville - Student Award Sponsorship	-\$200.00	\$14,408.73
28/02/2022	1/03/2022	Monthly Account Fee	-\$5.00	\$14,608.73
31/01/2022	1/02/2022	Monthly Account Fee	-\$5.00	\$14,613.73
31/12/2021	1/01/2022	Monthly Account Fee	-\$5.00	\$14,618.73

- Local Bank Term Deposit Account

Effective Date	Entered Date	Transaction Description	Amount	Balance
14/12/2022	13/12/2022	Interest Credit	\$80.69	\$21,539.44
	14/06/2022	Interest Credit	\$37.39	\$21,458.75

- IEEE CB Account

Date MM/DD/YYYY	Amount	Transaction Description
01/01/2022	2.14	Interest Paid
02/01/2022	2.46	Interest Paid
03/01/2022	2.22	Interest Paid
04/01/2022	2.54	Interest Paid
05/01/2022	2.60	Interest Paid
05/23/2022	4037.60	Section Rebate Revenue
06/01/2022	3.44	Interest Paid

1/07/2022	4.92	Interest Paid Interest Calculation: 6/1/2022 - 6/30/2022 @ .46
1/08/2022	6.20	Interest Paid Interest Calculation: 7/1/2022 - 7/31/2022 @ .56
15/08/2022	905.00	CBTRA STEM Grant 2022 - Practical Activities that Foster STEM Curiosity Among High School Students in Far North Queensland.
1/09/2022	7.81	Interest Paid Interest Calculation: 8/1/2022 - 8/31/2022 @ .68
27/09/2022	560.00	CBTRA PES High Performing Chapter Award 2022-2021 for Northern Australia Section Chapter
1/10/2022	9.77	Interest Paid Interest Calculation: 9/1/2022 - 9/30/2022 @ .85
14/10/2022	-6.30	CB Card Transaction 7298-M931734184-13-OCT-22--6.30-CROSS BORDER TRANS FEE---000000000-Bank Fee-----0.00
14/10/2022	-630.04	CB Card Transaction 7298-M931734185-13-OCT-22--630.04-SENMIC PTY LTD-DOUGLAS--048140000-Fast Food Restaurants-----0.00
1/11/2022	12.25	Interest Paid Interest Calculation: 10/1/2022 - 10/31/2022 @ 1.02
2/11/2022	-4.20	CB Card Transaction 7298-M934596206-02-NOV-22--4.20-CROSS BORDER TRANS FEE---000000000-Bank Fee-----0.00
2/11/2022	-420.35	CB Card Transaction 7298-M934596207-02-NOV-22--420.35-SENMIC PTY LTD-DOUGLAS--048140000-Fast Food Restaurants-----0.00
1/12/2022	21.14	Interest Paid Interest Calculation: 11/1/2022 - 11/30/2022 @ 1.91
8/12/2022	-382.40	CB Card Transaction 7298-M939377728-07-DEC-22--382.40-ROCKPOOL HOSPITALITY-NORTH WARD--048100000-Eating Places Restaurants-----0.00
8/12/2022	-3.82	CB Card Transaction 7298-M939377742-07-DEC-22--3.82-CROSS BORDER TRANS FEE---000000000-Bank Fee-----0.00
15/12/2022	-2,118.23	Intl Money Transfer Debit OTHER REFERENCE: IA429350000990// WIRE WT12234909260001 FOR 3124.55 AUD AT 0.67793 53042935-0

- Overall Report of all accounts as shown in the IEEE GEO Unit Income-Expense Details Report

Task Description	Transaction Type	Transaction Date	USD Amount
000 Professional Activities	Revenue	08/15/2022	905.00
000 Professional Activities	Revenue	09/27/2022	560.00
		Total 2.70.000 000 Professional Activities	1465.00
000 Rebate from IEEE	Revenue	05/23/2022	4037.60
		Total 3.10.000 000 Rebate from IEEE	4037.60
000 IEEE CB Account Interest	Revenue	01/01/2022	2.14
000 IEEE CB Account Interest	Revenue	02/01/2022	2.46
000 IEEE CB Account Interest	Revenue	03/01/2022	2.22
000 IEEE CB Account Interest	Revenue	04/01/2022	2.54
000 IEEE CB Account Interest	Revenue	05/01/2022	2.60
000 IEEE CB Account Interest	Revenue	06/01/2022	3.44
000 IEEE CB Account Interest	Revenue	07/01/2022	4.92
000 IEEE CB Account Interest	Revenue	08/01/2022	6.20
000 IEEE CB Account Interest	Revenue	09/01/2022	7.81
000 IEEE CB Account Interest	Revenue	10/01/2022	9.77

000 IEEE CB Account Interest	Revenue	11/01/2022	12.25
000 IEEE CB Account Interest	Revenue	12/01/2022	21.14
		Total 3.40.000 000 IEEE CB Account Interest	77.49
000 Non-IEEE CB Account Interest	Revenue	10/30/2022	0.28
000 Non-IEEE CB Account Interest	Revenue	12/25/2022	0.67
000 Non-IEEE CB Account Interest	Revenue	12/25/2022	54.05
		Total 3.45.000 000 Non-IEEE CB Account Interest	55.00
010 Section Meeting	Cost	12/08/2022	382.40
010 Section Meeting	Cost	10/30/2022	115.67
		Total 4.10.010 010 Section Meeting	498.07
000 Professional Activities	Cost	11/02/2022	420.35
000 Professional Activities	Cost	10/14/2022	630.04
000 Professional Activities	Cost	10/30/2022	431.35
000 Professional Activities	Cost	10/30/2022	640.62
000 Professional Activities	Cost	10/30/2022	195.14
		Total 4.70.000 000 Professional Activities	2317.50
020 Awards	Cost	07/31/2022	348.15
		Total 4.85.020 020 Awards	348.15
000 Travel Expense	Cost	04/12/2022	1909.29
000 Travel Expense	Cost	10/30/2022	804.59
000 Travel Expense	Cost	08/28/2022	838.04
		Total 5.20.000 000 Travel Expense	3551.92
010 Region Travel	Cost	12/15/2022	2118.23
		Total 5.20.010 010 Region Travel	2118.23
010 Bank & Credit-Card Fees	Cost	04/30/2022	6.97
010 Bank & Credit-Card Fees	Cost	06/30/2022	7.25
010 Bank & Credit-Card Fees	Cost	05/31/2022	6.96
010 Bank & Credit-Card Fees	Cost	02/28/2022	6.93
010 Bank & Credit-Card Fees	Cost	03/31/2022	6.66
010 Bank & Credit-Card Fees	Cost	01/31/2022	3.53
010 Bank & Credit-Card Fees	Cost	11/02/2022	4.20
010 Bank & Credit-Card Fees	Cost	10/14/2022	6.30
010 Bank & Credit-Card Fees	Cost	12/08/2022	3.82
010 Bank & Credit-Card Fees	Cost	09/25/2022	3.29
010 Bank & Credit-Card Fees	Cost	10/30/2022	3.21
010 Bank & Credit-Card Fees	Cost	11/27/2022	3.37
010 Bank & Credit-Card Fees	Cost	11/27/2022	3.37
010 Bank & Credit-Card Fees	Cost	08/28/2022	3.49

010 Bank & Credit-Card Fees	Cost	01/07/2022	3.58
010 Bank & Credit-Card Fees	Cost	12/25/2022	3.35
		Total 5.60.010 010 Bank & Credit-Card Fees	76.28
000 Other	Cost	05/24/2022	421.64
000 Other	Cost	05/19/2022	213.52
000 Other	Cost	03/22/2022	269.91
		Total 6.20.000 000 Other	905.07

PART B - ORGANIZATIONAL ACTIVITIES

B.1 Membership Development Activities

- Total number of active members in the past 3 years.
 - We had 141 members on 28 Jan 2022. This was slowly grown over the few years before that.
 - As at 25 Feb 2022, we have 156 members, which shows **>10% growth in 2022-23**.
- Summary and evidence of work done to improve the value of membership, which leads to retention and growth of members
 - Held a wide range of technical & networking events in different locations within the section, including in Cairns and Townsville.
 - Sponsored student membership and awarded student awards to attract high-caliber student members.
 - Held near 20 events including 5+ in-person events in Townsville and Cairns.
 - We have also fully supported the attendance of our Student Branch, YP, and WIE Chairs to one of the key R10 or local events in the year 2022. This has resulted in more students recognizing the professional development and networking opportunities their membership can bring them. Although this has incurred significant cost to our Section, we see value in giving back to our members in supporting their development to become future leaders of our Section.
 - We have also focused on high profile events such the Peter Arlett lecture to attract new members as well as reached out into the community through judging robotics competitions, volunteering at School outreach programs etc. For instance, the picture below shows an intro into electronics engineering for Townsville high school students at an STEM event hosted at James Cook University. Associate Prof Mostafa Rahimi Azghadi (Section Chair) ran the workshop with help from other Section volunteers.



Left to Right: Associate Prof Mostafa Rahimi Azghadi (Section Chair), Ethan Waters (Student Branch Chair), Matthew Whelan and Melanie Olsen (former Section Chairs) running a workshop about electronics engineering for Townsville high school students.

B.2 Chapter Activities

- Total number of Chapters in the Section
 - Two (2) (MTT/Comm and PES). We are also part of an Australia wide OES Chapter
- Number of Chapters formed in the current year
 - Nil
- Number of active Chapters (Chapters who have reported required number of meetings during the year)
 - All Two (2) (MTT/Comm and PES) full chapters were active this year and we also reported activity locally as part of the Australia wide OES Chapter.
- Summary of Chapter activities (Chapter wise with attachment table/information)

PES Chapter Activities:

- Held seven joint executive meetings through the year.
- 08 Dec 2022 - Dr Hesam Marzooghi, THE IMPACT OF RENEWABLE ENERGY SOURCES ON DYNAMICS, OPERATION, AND CONTROL OF FUTURE POWER SYSTEMS, 12 attendees online.
- 13 Oct 2022 - 2022 IEEE NORTH AUSTRALIA PETER ARLETT LECTURE, Prof. Syed Islam and Dr Daniel Eghbal, 35 attendees online and in-person.
- 06 Oct 2022 - Dr Rakibuzzaman Shah, ENHANCED SYSTEM PLANNING THROUGH DISTRIBUTION AND TRANSMISSION SYSTEM INTERACTION, 12 attendees online.
- 09 May 2022 - Professor Iqbal Husain of North Carolina State University - POWER DISTRIBUTION SYSTEM MODERNIZATION WITH POWER ELECTRONIC CONVERTERS AND INTEGRATED RENEWABLES, 32 attendees online.
- 06 May 2022 – Dr Wei Du of Pacific Northwest National Laboratory, USA, GRID-FORMING INVERTERS AT SCALE--A JOURNEY FROM A SINGLE MICROGRID TO A BULK POWER SYSTEM WITH 10,000+ INVERTERS, 189 attendees online.

MTT/Comm Chapter Activities:

- Held seven joint executive meetings through the year.
- 23 Sep 2022 - PROF LEVENT SEVGI DL - ELECTROMAGNETICS EDUCATION AND DIFFRACTION MODELING & SIMULATION, 14 attendees in-person.
- 01 July 2022 - Prof. Shiyoshi Yokoyama of Kyushu University, POLYMER PHOTONICS – CHALLENGES AND APPROACHES FOR A HIGHLY SCALABLE PLATFORM IN ULTRADENSE OPTICAL COMMUNICATIONS, 40 attendees online.
- 30 Jun 2022 - Grace Lim Soo Yong, PROPAGATION MODELING AND MEASUREMENTS IN COMPLEX ENVIRONMENTS FOR 5G COMMUNICATIONS, 25 attendees online.
- 26 May 2022 - Dr Marta Guardiola -NOVEL APPLICATIONS OF MICROWAVE IMAGING, 30 attendees online.
- 28 April 2022 – Prof. Masayuki Fujita, ADVANCED TERAHERTZ DEVICES AND SYSTEMS, 40 attendees online.
- 06 April 2022 - Mr Anthony Murphy, REINVENTING X-RAY TECHNOLOGY, 20 attendees online.
- 30 March 2022 – IEEE MTT Distinguished Lecture, RF DESIGN FOR ULTRA-LOW-POWER WIRELESS COMMUNICATION SYSTEMS: EFFICIENTLY MINIATURIZING AND PASSIVELY SENSING.
- 10 March 2022 – Dr Tony Murphy, PLASMA APPLICATIONS OLD AND NEW, 30 attendees in-person.
- 02 Mar 2022, Prof. Changzhi Li, PORTABLE RADAR SYSTEMS FOR LIFE ACTIVITY SENSING, 18 attendees online.

B.3 Professional and Continuing Education Activities

Summary of continuing Educational activities including conferences, technical activities, training courses, and distinguished lecture programs with attachment table / information

- Our main continuing education activity for the past 12 years has been the annual Peter Arlett Lecture, which is our Section flagship event gathering the most number of members in one even throughout the

year. We usually bring high-profile people from industry and academia to our Section to provide a technical and/or a general seminar on a key problem in the Power and Energy Domain.

PA Lecture is also always preceded by a networking event, where the Section provides food and drink to incentivise more interaction from the community in the Townsville region.

- We also host at least one distinguished lecture each year, which considering the small size of our Section has been very successful over the past few years. For instance in 2022, our Section hosted the following DL events.
 - Organized a face-to-face distinguished lecturer seminar at Cairns and hosted Professor Levent Sevgi.
 - The students very much liked the opportunity to have face-to-face communication with world-leading researchers.
 - 30 March 2022 – IEEE MTT Distinguished Lecture, RF DESIGN FOR ULTRA-LOW-POWER WIRELESS COMMUNICATION SYSTEMS: EFFICIENTLY MINIATURIZING AND PASSIVELY SENSING.



IEEE MTT Distinguished Lecture in Cairns

B.4 Students Activities

- Total number of Student Branches in the Section
 - One (1) with Two new branches through SubSection
- Number of Student Branches formed in the current year
 - Nil, although 2 through SubSection
- Section level student activities (student congress, paper and other contests, awards etc)
- Number of active Student Branches (Student Branches who have reported required number of meetings during the year)
 - One (1) and two new ones through Sub-section that need more assistance with reporting
- Summary of Student Branch activities (Student Branch wise with attachment table/information)
 - Arduino workshop at a local school with twenty students in attendance for 2 hours on 07/08/2022. The picture below shows the student branch Chair, Ethan Waters interacting with the students.



The student branch Chair, Ethan Waters interacting with the students at the Enkindle Village School on 07/08/2022.

- Developed a robotic unit and attended in the Robot-X Global Competition in Sydney, Nov 2022. The development included five demonstrations and trials at the Australian institute of Marine Science (AIMS) which each occurred over a period of a few days. These were to demonstrate and collaborate with the scientists and engineers at the AIMS facilities. Approximately forty people attended autonomous system demonstrations each of the five times. These occurred on the following dates, 30/08/2022 - 31/08/2022, 13/09/2022 - 14/09/2022, 19/09/2022 - 20/09/2022, 26/09/2022 - 30/09/2022, 06/10/2022 - 12/10/2022.



Dr Shou-Han Zho, the student branch mentor (left), and Ethan Waters (second left), the IEEE student branch chair, at the testing site in Australian Institute of Marine Sciences.

- Zumo soccer competition & BBQ with 40 people in attendance on 22/08/22.
The JCU student branch hosted a large event in Aug 2022 by organizing a robotic competition using Zumo soccer robots. The event also included networking and a BBQ lunch.



Student Branch Zumo soccer competition & BBQ with 40 people in attendance on 22/08/22.

B.5 Affinity Group Activities

- Young Professional (YP)
 - Held seven joint executive meetings through the year.
 - 30 Nov 2022 - Distinguished Professor Jie Lu, ARC DP WORKSHOP - INVITED SEMINAR: HOW TO WRITE SUCCESSFUL ARC PROJECT APPLICATIONS, 18 attendees online.
 - 29 Nov 2022 - FUTURE-PROOFING YOUR CAREER IN STEM – A PANEL DISCUSSION, 20 attendees online.
 - 23 Sep 2022 - PROF LEVENT SEVGI DL - ELECTROMAGNETICS EDUCATION AND DIFFRACTION MODELING & SIMULATION, 14 attendees in-person.
 - 13 Sep 2022 – Mark Ames, INTRODUCTION TO THE IEEE SOCIETY ON SOCIAL IMPLICATIONS OF TECHNOLOGY – SSIT, 7 attendees online.
 - 25 Aug 2022 - JCU SMITHFIELD IDEAS LAB - SITE TOUR, 10 attendees in-person.
 - 16 July 2022 - CODING AND SENSORS TRAINING WORKSHOP FOR HIGH-SCHOOL STUDENTS, 25 attendees in-person.
 - 06 April 2022 - Mr Anthony Murphy, REINVENTING X-RAY TECHNOLOGY, 20 attendees online.
 - 10 March 2022 – Dr Tony Murphy, PLASMA APPLICATIONS OLD AND NEW, 30 attendees in-person.
 - 09 March 2022 - AIMS-IEEE NORTHERN AUSTRALIA HOSTING CHIEF SCIENTISTS OF AUSTRALIA. This was a joint event with the Australian Institute of Marine Sciences (AIMS) to host Australian Chief Scientist, Dr. Cathy Foley, 5 attendees in-person.
- Women In Engineering (WIE)
 - Held seven joint executive meetings through the year.
 - 30 Nov 2022 - Distinguished Professor Jie Lu, ARC DP WORKSHOP - INVITED SEMINAR: HOW TO WRITE SUCCESSFUL ARC PROJECT APPLICATIONS, 18 attendees online.
 - 29 Nov 2022 - FUTURE-PROOFING YOUR CAREER IN STEM – A PANEL DISCUSSION, 20 attendees online.

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- 09 March 2022 - AIMS-IEEE NORTHERN AUSTRALIA HOSTING CHIEF SCIENTISTS OF AUSTRALIA. This was a joint event with the Australian Institute of Marine Sciences (AIMS) to host Australian Chief Scientist, Dr. Cathy Foley, 5 attendees in-person.

B.6 Awards & Recognition Activities

- Award constituted by the Section
 - IEEE Northern Australia section awards four undergraduate students has been awarding for the past 7 years at University awards ceremonies:
 - Townsville: 1st year Engineering Student with highest GPA, who is joining Electrical/ Computer Engineering UG program.
 - Townsville: 4th year Electrical/ Computer Engineering Student for the best project work.
 - Darwin: IEEE prize awarded to a 3rd year Electrical Engineering Student with the highest GPA.
 - Darwin: IEEE prize awarded to the best CDU Computer Science Student.
- Please list all Awards and Recognitions received by the Section, and members in the Section, from R10 and IEEE HQ during the year
 - The section received certificate of recognition from the IEEE Member Recruitment and Recovery Committee for outstanding achievement in member retention in 2022.
 - PES chapter received a 2021-2022 IEEE PES High Performing Chapter Program award and prize
 - Received an honorary mention in the 2022 ComSoc Student Competition "Communications Technology Changing the World." A project proposal with the title "IoT-Enabled Smart Farming in Queensland" received an Honorary Mention. It was ranked among the best 14 projects among the 67 submitted (20%).

B.7 Communication Activities (Newsletter, Home Page, E-mail etc.)

- Newsletter (name and number of issues in the year)
- Home Page of the Section (give the URL and how often it is updated)
 - Website was revamped this year and is typically updated on an ad-hoc basis
<https://r10.ieee.org/naus/>
 - LinkedIn Group for the Section was formed in 2022 and has been actively posting about the events etc.
<https://www.linkedin.com/company/82341453/admin/>
- Other means of contacts with Section members including social media
 - ✧ An invitation to all the Section events is emailed by the Section Chair to all the Section members twice at two weeks and one week before any event.
 - ✧ Collabratec is setup for storing Exec content.

B.8 Industry Relations

- Membership growth and retention
 - Have had good growth in Industry membership over recent years. Especially our member number **has grown by 10% in 2022-23**, which is a great for our small Section. This growth has been due to our

wide range of activities including many face-to-face events, which has attracted industry people to our events and incentivizes their membership.

- Activities for/with industrial members
 - Our main activity for industry in our region has been our Peter Arlett Lecture, which is the Flagship annual event of the IEEE Northern Australia Section. The Peter Arlett lecture is IEEE North Australia section and PES chapter's most prestigious event each year in Townsville where the chapter reaches out to the local Power Engineering community with a technical presentation of interest to the sections' members. In 2022, the lecture was preceded by a social networking event with finger food and drinks. The 2022 PA Lecture was delivered by two internationally recognised leaders in the field of Net Zero and its future. The two speakers and their talk titles were as follows:
 - Prof. Syed Islam of Federation University
 - Topic: Australian Net Zero Target in 2050: Challenges and Opportunities
 - Dr Daniel Eghbal of Energy Queensland
 - Topic: A smarter grid driven by net zero emission targets

The event was attended by ~40 IEEE and non-IEEE members from across the Townsville region, representing the local industry, university researchers, and postgraduate and undergraduate students, as well as the Arlett's family.

B.9 Humanitarian Technology Activities

- Humanitarian Technology related activities supported by the Section including collaboration with other OUs.
- SIGHT Activities

B.10 Community Activities

- IEEE Social activities (Family day, IEEE day, Engineers Week)”
 - 16 July 2022 - CODING AND SENSORS TRAINING WORKSHOP FOR HIGH-SCHOOL STUDENTS from 7 local schools, which was attended by 20 students in person and hosted by 5 IEEE members including the Section Chair.
 - 13 Sep 2022 – Mark Ames, INTRODUCTION TO THE IEEE SOCIETY ON SOCIAL IMPLICATIONS OF TECHNOLOGY – SSIT, 7 attendees online.
 - Arduino workshop at a local school with twenty students in attendance for 2 hours on 07/08/2022.

PART C - OTHERS

C.1 Special Events

- Please briefly describe the importance of special events and the outcomes achieved.
 - The Peter Arlett event is held in honour of Peter Arlett from the NA Region, and it is always a highlight from our Section in our region.
- Funding secured from the IEEE and external sources including sponsorships.
 - High Performing PES Section Award
 - CBTRA STEM Grant 2022 - Practical Activities that Foster STEM Curiosity Among High School Students in Far North Queensland. US\$905.
 - Student Branch attracted funding through sponsorships. The student branch advertised the sponsors at technical events on banners and robotic systems developed by the branch

members. The sponsors are advertised on the IEEE student Facebook and webpage. The student branch started 2022 with \$2762.84 and then acquired approximately \$20,000 of sponsorship in the form of cash and electronics. These were mainly acquired for the main activity of the student branch in 2022, i.e. the Robo-X robotic competition.

C.2 Relationship with National and International Societies and Non-Government Organizations (NGO)

- Nature of relationship and details of any formal agreement signed
 - Working with Australia Council to sign MOU with Engineers Australia
- Details of joint activities
 - Many of our virtual events were advertised across Australia.
- Benefit to IEEE members (for example discounts, access to technical information etc.)
 - Subsidised or free membership cost to attract student members who were awarded an IEEE NA Section award
- Benefit to Section (for example help in membership development, venue facilities, cost saving etc.)
 - Increase in exposure of IEEE within our region and exposure of our members to new technology areas outside of those typically promoted within IEEE Northern Australia (e.g. Renewable Energies, Artificial Intelligence and Marine Engineering).
 - This has resulted in more than **10% increase in our member number compared to 2022.**

C3. Collaboration with other IEEE Sections

- Support extended to neighboring Sections
 - Supported events to boost the newly formed IEEE Northern Territory sub-section.
 - Shared hosted events with other sections and chapters nationally through virtual presentation formats.
 - As part of the Australia Council our section contributes to Australia wide initiatives such as the student branch competitions and also consultation on important matters relevant to Australia.
 - Supported a tree planning initiative by the ACT Section during the R10 visit to Australia in July 2022. Paid \$150 to the ACT Section for this event.
- Joint activities with any other Section
 - The Northern Australia section covers a huge geographical area. The nearest section is approximately 1500km from our sections geographic centre. Joint activities typically involve coordinating visiting lecturers throughout the year and cohosting virtual events. The vast majority of our virtual technical seminars were also cohosted with other Australian sections.

C.4 Support extended to Sub-sections & Society Chapters within the Section

- Support extended for organising technical, educational and professional activities
 - Supported student awards by the Northern Territory Subsection through payment of the award
 - Fully supported our Section MTT-Com Society Chapter Vice-Chair to attend the IEEE 2022 Region 10 Students, Young Professionals, Women in Engineering, Life Members Congress at Jeju Island, Korea. This was in his capacity as the TP chair as well.
- Joint activities for membership development
 - Key membership development activities were focused on joint technical talks and networking events often involving industry partners such as Energy Queensland and the Australian Institute of Marine Science.
- Support extended for the formation of a Sub-section or transition of a Sub-section into a full Section
 - Supported the new Northern Territory sub-section in Darwin in 2021. Provided advice and substantial financial support to the sub-section for events and awards, as well as support for hosting future international IEEE events.

C.5 Best Practices of your Section (which you would like to share with other Sections for the benefits of members)

- One of the key strength of our Section has been many interactions with the local community through various events. These include the following:
 - 16 July 2022 - CODING AND SENSORS TRAINING WORKSHOP FOR HIGH-SCHOOL STUDENTS from 7 local schools, which was attended by 20 students in person and hosted by 5 IEEE members including the Section Chair.
 - Arduino workshop at a local school with twenty students in attendance for 2 hours on 07/08/2022.
- Executive committee members were encouraged to assist with the planning and execution of key events throughout the year. This was very successful not only leading to outstanding events but also empowering members within the Section. This has led to increased interest from members, particularly young members to take on new executive roles within the Section.
- An activities calendar was developed at the start of the year to set dates and start planning for key events in the year. This planning was useful to ensure funding was available to support upcoming events and new initiatives.
- The WIE and YP affinity groups were more active this year thanks to new leadership joining the NA Section for 2022.
- A strategic plan for the section was developed in 2019 which helped define what are the main aims of the section and give executive members a resource to assess how best to focus resources in future years. This was reviewed during the year with a 2022 membership development plan established to really focus efforts into industry in the coming year. **This resulted in a membership growth of more than 10% in 2023.**

C.6 Problems anticipated and suggestions for solutions, if any

The executive needs to continue to invite and encourage the student branch, YP, WIE executive committee members to attend Section executive committee meetings and plan events for a more active 2023 year compared to 2022.

PART D - GOALS AND PLANS

D.1 Continuation of project/activity in progress and their implementation plans

The NA Section website was maintained in 2022 as well as continuing an archive for important documentation such as the section's history, photographic records, strategic plan, etc on both the website and Collabratec.

D.2 Goals and Future Plans

Due to its small size, our Section has not been recognizing its volunteers widely. A plan for 2023 is to setup at least 2 of the below awards.

- IEEE Northern Australia Outstanding Volunteer
- IEEE Northern Australia Outstanding Young Professional
- IEEE Northern Australia Outstanding Women In Engineering Volunteer
- IEEE Northern Australia Outstanding Student Volunteer

D.3 Any innovative ideas to make IEEE more creative and value added for sustaining the membership retention and recruitment goals.

Investigate opportunities for hands-on workshops catering to the interests and needs of local members. These could be non-technical in nature and may include a networking/ social focus as well.

Hold an Industry meets Student members event possibly with a Mock Job Interview element included. The event might also incorporate a YP and /or WIE affinity group focus as well.

Engage in regional events involving problem solving, engineering & innovation initiatives to broaden our member-base. This includes joint events with other engineering groups (especially affinity groups) and wider community initiatives such as science week.

Incorporate social media and more frequent website promotion into our advertising regime, to increase the audience at our activities and our presence in the community.

Given the interest in robotics within our student and industry membership base, we will also be working to establish a community engaged robotics competition, including encouraging friendly competition between our Cairns and Townsville groups.

D.4 Business Plan for Sustainable Growth and Financial Stability.

The Section is fortunate to have a stable organizational committee with a good mix of members from academic and industry backgrounds that understand the area and member needs. The executive committee includes representation from many of the major regional cities within the section including Cairns, Townsville and Darwin to encourage activities in the various regions. The executive members are also generally highly motivated and willing to assist and support the Section as required.

By focusing on a small number of high-profile events and including networking opportunities, the Section aims to remain relevant to the needs of local members and promote growth within the wider professional community.